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Health Insurance and Cancer Screening Among Women

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Introduction

Health insurance coverage is an important factor associated with use of preventive health care services. Uninsured persons use less preventive health care than do those with insurance, and among persons with insurance, use of preventive care varies with the type of coverage. The Rand Health Insurance Experiment (HIE), in which persons were randomly assigned to insurance plans, showed that those enrolled in Health Maintenance Organizations (HMOs) received more preventive health care than did those with fee-for-service coverage, and that use of preventive care was inversely related to the level of out-of-pocket spending (1). Results from the HIE also showed that poor women with free fee-for-service coverage were more likely to receive Pap tests than those with cost-sharing plans (2). In contrast, among nonpoor women, there was no difference in Pap test usage between women with free and cost-sharing plans (2). An analysis of data from the 1987 National Health Interview Survey (NHIS) found that cancer screening rates were greater for women who reported an HMO as their usual source of care than for those who reported some other place as their usual source of care (3).

The purpose of this report is to provide national data on the relationship between type of health insurance coverage and recent use of mammography, clinical breast examinations (CBEs), and Pap tests by women 40 years of age and over. Objectives are to compare use of screening between women enrolled in HMOs and fee-for-service plans; between women with private coverage, public coverage, and the uninsured; and between women with different types of health insurance coverage after controlling for educational attainment.

The data presented in this report extend previous studies by providing recent national data on the use of preventive care by women enrolled in a broad range of HMOs compared with many studies that are based on one or two specific HMOs. In addition, the NHIS is sufficiently large to allow results to be presented for subgroups of women based on age and socioeconomic status. Of particular interest is whether the effect of HMO enrollment on use of preventive measures differs by socioeconomic status. The 1992 NHIS also provided more detailed information concerning HMO enrollment than did earlier years of the survey.

During the 1980's there were substantial changes in health insurance coverage as well as use of preventive health care in the United States. Between 1980 and 1992 the age-adjusted percent of the U.S. population under 65 years of age who were uninsured increased from 12.5 to 17.2 percent (4). Over this period, enrollment in HMOs rose from 4 to 14 percent of persons in the United States (4). HMOs have become increasingly complex in structure with group, network, independent practice associations (IPAs), and preferred provider organizations (PPOs) making up a rising proportion of the market (5). HMO enrollment by Medicare and Medicaid beneficiaries has increased in recent years. In 1992, 6 percent of HMO enrollees were Medicare beneficiaries and another 5 percent were enrolled through Medicaid (4).

The effectiveness of Pap tests in reducing cervical cancer mortality for women of all ages has been clearly demonstrated (6), as has the effectiveness of mammography screening in reducing breast cancer mortality for women over 50 years of age (7–9). However, cancer screening guidelines differ across organizations, primarily for women 40–49 years of age (see Technical notes for background information on breast and cervical cancer).

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Healthy People 2000, a national prevention initiative, has set 300 objectives for the Nation for the year 2000, including objectives for breast and cervical cancer screening (10). Between 1987 and 1992 substantial progress was made toward the *Healthy People 2000* objectives for breast cancer screening (11). The percent of women 50 years of age and over who had both a CBE and a mammogram within the preceding 1 to 2 years doubled, from 25 to 51 percent. The percent of women 18 years and over with a Pap test within the preceding 3 years remained fairly stable over this period, about 75 percent. Use of mammography and other screening services has been shown to be inversely associated with income and educational attainment (12,13).

Methods

This report uses data from the 1992 National Health Interview Survey, a continuing household survey of the civilian noninstitutionalized population conducted by the National Center for Health Statistics (NCHS) (14) (see Technical notes). The NHIS questionnaire consists of two major sections—the basic health and sociodemographic section, which remains constant from year to year, and a special topics section, which changes each year. The 1992 NHIS included a special topics section on Cancer Epidemiology and Cancer Control, a collaborative effort of NCHS and the National Cancer Institute. The Cancer Control section of the questionnaire was administered to one-quarter of the NHIS sample households (15). Questions on cancer screening included length of time since the last Pap test, mammogram, and CBE.

In 1992 information on health insurance coverage was collected from a household respondent concerning plans held at the time of the interview for all household members. The health insurance questionnaire was administered in all of the NHIS sample households (16). Information from the health insurance questions include the following data on any public coverage and up to four private health insurance plans: the type of health care coverage (Medicare, Medicaid, military/CHAMPUS/CHAMP-VA, other public assistance, or private insurance); the plan name of each private insurance plan and whether each private insurance plan was an HMO; and the coverage status for each individual in the household. During data processing, the plan names were matched to a precoded list of plans that provided information on whether a particular plan was an HMO. Thus, information on whether a particular plan was an HMO was available from a precoded list of plan names as well as from the respondent. In this analysis, individuals were classified as having HMO coverage if both sources of information agreed that the plan was an HMO. This approach resulted in an estimate of 16 percent of the civilian noninstitutionalized U.S. population having HMO coverage in 1992, a level similar to the 14 percent of the U.S. population estimated by InterStudy's annual national census of HMOs (4). Of all HMO enrollees identified in the 1992 NHIS, only 1 percent were Medicaid beneficiaries and 7 percent were Medicare beneficiaries. The 1992 NHIS included a question about HMO enrollment only for respondents reporting private insurance coverage. Thus, it is not surprising that the percent of HMO enrollees who were Medicaid beneficiaries was lower in the 1992 NHIS than the 5 percent reported by InterStudy (4).

In this report women were classified into the following health insurance categories: private coverage, specific types of public coverage, and uninsured. Women with private coverage were subdivided into two groups—those with HMO coverage and those with fee-for-service coverage. The HMO category includes all women who reported HMO coverage, regardless of other coverage reported. Among women with public coverage, the Medicaid category includes all women who reported Medicaid and did not report HMO coverage, regardless of other coverage reported. Uninsured individuals were defined as those who did not report private insurance, Medicare, Medicaid, military/CHAMPUS/CHAMP-VA, or public assistance coverage. Screening results for women under 65 years of age who reported only Medicare, military, or public assistance coverage are not shown because of small numbers. Screening results for uninsured women 65 years of age and over who were uninsured or who reported military or public assistance coverage are not shown due to small numbers.

The relationship between health insurance coverage and use of screening was examined for women in subgroups based on age (40–49, 50–64, and 65 years and over) and educational attainment (12 years or less and more than 12 years) because both characteristics are among those associated with use of screening and type of health insurance coverage. Results are reported separately for women aged 40–49 and 50–64 years because screening recommendations differ for these two groups. Results for women 65 years and over are reported separately because almost all women in this age group have Medicare coverage and also because screening levels are substantially lower for older women. Screening in the past 12 months, rather than a longer interval, was used for the analysis because health insurance coverage can change over time. However, because annual mammography is not generally recommended for women aged 40–49 years (see Technical notes) the mammography results should be interpreted with caution. Women with hysterectomies have been included in analyses of Pap testing because the Pap test may be used in the detection of vaginal cancer as well as cervical cancer (17).

Percents and standard errors were calculated using SUDAAN, a statistical program for survey data analysis that incorporates the NHIS sample weights and complex survey design into its estimates (18). Contingency table analysis was carried out using SUDAAN and weighted least squares linear modeling to test hypotheses regarding associations between health insurance, educational attainment, and use of screening (18,19). Differences discussed in the text were statistically significant at the 0.05 level.

Of the 3,863 women aged 40 years and over who were asked about

screening in the 1992 NHIS, data on time since the last mammogram, CBE, or Pap test were missing for 4 to 5 percent of women; private health insurance coverage was missing for 2 percent; and educational attainment was missing for less than 1 percent. Persons with missing data have been excluded from analyses involving the missing variable.

Results

Health insurance coverage (table 1)

In 1992, 80 percent of women 40–64 years of age had private insurance, including 19 percent who were enrolled in an HMO. Among women aged 40–64 years, about 12 percent were uninsured, 5 percent had Medicaid coverage, and the remaining 3 percent had military/CHAMPUS, Medicare, or public assistance coverage. Health insurance coverage for women aged 40–64 years varied substantially with educational attainment. Women with 12 years of education or less were nearly three times as likely to be uninsured, almost five times as likely to have Medicaid coverage, and one-third less likely to be enrolled in HMOs as women with more education.

In 1992 almost all women aged 65 years and over in the non-institutionalized population had Medicare coverage, and 75 percent also had private coverage, including 11 percent who were enrolled in an HMO. Women aged 65 years and over with 12 years of education or less were about one-third less likely to be enrolled in an HMO, 77 percent more likely to have only Medicare coverage, and almost six times as likely to have Medicaid coverage as women with more education.

Table 1. Percent distribution of health insurance coverage among women 40 years and over, according to age and educational attainment: United States, 1992

Age and health insurance coverage	Total	Educational attainment: 0–12 years	Educational attainment: 13 years or more
	Percent distribution and standard error		
40–64 years			
Total	100.0	100.0	100.0
Private coverage	80.4 (0.9)	73.6 (1.4)	90.8 (1.1)
HMO	19.0 (1.0)	15.9 (1.4)	23.8 (1.6)
Fee-for-service	61.4 (1.2)	57.7 (1.6)	67.0 (1.8)
Medicaid	5.4 (0.5)	7.8 (0.8)	1.7 (0.5)
Other	2.5 (0.4)	3.1 (0.5)	1.7 (0.4)
Uninsured	11.6 (0.7)	15.5 (1.1)	5.8 (0.9)
40–49 years			
Total	100.0	100.0	100.0
Private coverage	81.1 (1.3)	72.7 (2.1)	89.8 (1.4)
HMO	21.4 (1.5)	17.9 (2.1)	25.0 (1.9)
Fee-for-service	59.7 (1.7)	54.8 (2.6)	64.8 (2.3)
Medicaid	5.4 (0.6)	8.6 (1.1)	2.2 (0.6)
Other	1.6 (0.3)	1.8 (0.5)	1.4 (0.4)
Uninsured	11.9 (1.1)	17.0 (1.8)	6.6 (1.2)
50–64 years			
Total	100.0	100.0	100.0
Private coverage	79.8 (1.3)	74.2 (1.8)	92.4 (1.4)
HMO	16.7 (1.3)	14.4 (1.7)	21.9 (2.4)
Fee-for-service	63.1 (1.7)	59.9 (2.1)	70.5 (2.7)
Medicaid	5.4 (0.7)	7.3 (1.0)	1.0 (0.5)
Other	3.4 (0.6)	4.0 (0.8)	2.1 (0.8)
Uninsured	11.4 (1.2)	14.5 (1.7)	4.5 (1.1)
65 years and over			
Total	100.0	100.0	100.0
Medicare and private coverage[1]	74.6 (1.3)	71.1 (1.5)	87.4 (2.1)
Medicare and HMO[1]	10.7 (1.0)	9.6 (1.0)	14.7 (2.9)
Medicare and fee-for-service[1]	63.9 (1.5)	61.5 (1.7)	72.7 (3.0)
Medicare and Medicaid[1]	7.6 (0.7)	9.3 (0.8)	1.6 (0.6)
Medicare only	16.8 (1.1)	18.6 (1.2)	10.5 (2.0)
Other	0.7 (0.2)	0.7 (0.3)	0.4 (0.3)
Uninsured	0.2 (0.1)	0.3 (0.1)	–

[1]Includes a small number of persons who did not have Medicare coverage. Of all women 65 years and over, 3 percent did not have Medicare coverage.

NOTES: Based on the one-fourth of the NHIS sample that received the Cancer Control questions. HMO includes all persons who reported HMO coverage, regardless of other coverage reported. Persons with Medicaid who did not report HMO coverage are classified as Medicaid. The category ''other'' includes military/CHAMPUS, public assistance, or Medicare (for women under 65 years of age). Uninsured persons are those who did not report private, Medicare, Medicaid, military/CHAMPUS, or public assistance coverage.

Screening for women 50–64 years (table 2)

In 1992, 50 percent of women aged 50–64 years reported a mammogram within the past year, 53 percent reported a Pap test, and 61 percent reported CBE. Health insurance coverage and educational attainment were strongly associated with use of each of these procedures for women aged 50–64 years.

The percent of women reporting each of the three procedures was lowest for uninsured women and highest for women enrolled in HMOs. Only 19 percent of uninsured women aged 50–64 years reported recent mammography, 32 percent reported Pap testing, and 38 percent reported CBE. In contrast, 62 percent of women aged 50–64 years enrolled in HMOs reported recent mammography, 65 percent reported Pap testing, and 71 percent reported CBE.

Among women aged 50–64 years with 12 years of education or less, HMO enrollees reported greater use of each of these procedures than did women with fee-for-service coverage. However, among women with more than 12 years of education, HMO enrollees and women with fee-for-service coverage reported similar screening

levels. For example, among women aged 50–64 years with 12 years of education or less, 63 percent of HMO enrollees and 48 percent of women with fee-for-service private coverage reported recent mammography. However, among women with more than 12 years of education, similar levels of screening were reported (61–64 percent). About three of five women aged 50–64 years who were enrolled in HMOs reported recent use of mammography, regardless of educational level. In contrast, among women with fee-for-service coverage, mammography was more likely to be reported by those with more than 12 years of education than by women with less education.

Table 2. Percent of women 50–64 years who received cancer screening within the past year, by type of procedure, health insurance coverage, and educational attainment: United States, 1992

Type of procedure and health insurance coverage	Sample size	Educational attainment		
		Total	0–12 years	13 years or more
		Percent and standard error		
Mammogram				
Total	1,171	49.6 (1.8)	44.8 (2.1)	60.6 (3.1)
Private coverage	910	55.4 (2.0)	51.0 (2.5)	63.3 (3.2)
HMO	190	62.1 (4.0)	62.8 (5.6)	61.0 (6.8)
Fee-for-service	720	53.6 (2.3)	48.1 (2.8)	64.0 (3.6)
Medicaid	90	38.3 (6.9)	38.0 (7.1)	*
Uninsured	130	19.3 (4.1)	19.2 (4.2)	*
Clinical breast examination (CBE)				
Total	1,168	60.8 (1.8)	57.4 (2.2)	68.4 (2.6)
Private coverage	906	65.2 (2.0)	62.2 (2.6)	70.7 (2.6)
HMO	188	70.5 (3.7)	71.8 (5.7)	68.7 (5.5)
Fee-for-service	718	63.8 (2.1)	60.0 (2.7)	71.3 (2.9)
Medicaid	90	52.0 (7.5)	52.1 (7.8)	*
Uninsured	132	38.2 (5.9)	37.7 (6.4)	*
Pap test				
Total	1,171	53.4 (1.7)	49.5 (2.1)	62.2 (2.9)
Private coverage	909	57.9 (1.9)	54.4 (2.4)	64.2 (3.0)
HMO	192	64.7 (3.5)	63.8 (5.0)	66.1 (5.8)
Fee-for-service	717	56.0 (2.2)	52.1 (2.6)	63.5 (3.3)
Medicaid	92	41.0 (7.0)	40.1 (7.2)	*
Uninsured	129	32.0 (5.9)	31.5 (6.2)	*

NOTES: Based on the one-fourth of the NHIS sample that received the Cancer Control questions. HMO includes all persons who reported HMO coverage, regardless of other coverage reported. Persons with Medicaid who did not report HMO coverage are classified as Medicaid. Uninsured persons are those who did not report private, Medicare, Medicaid, military/CHAMPUS, or public assistance coverage.

Women 65 years and over (table 3)

In 1992, overall 36 percent of women aged 65 years and over reported a recent Pap test, 39 percent reported recent mammography, and 50 percent reported a recent CBE. Screening levels for these three procedures were 11–18 percentage points lower for women 65 years and over than for women 50–64 years, despite the higher risk of disease among older women. Health insurance coverage and educational attainment were both strongly associated with use of each of the screening procedures. Screening levels for each of the procedures were highest (63 percent) for women enrolled in HMOs who had more than 12 years of education.

Women aged 65 years and over with only Medicare coverage were substantially less likely to report any of the three screening techniques than women with Medicare and private insurance. Reports of recent mammography were more than twice as likely for women with private insurance as for those with only Medicare coverage (40 percent compared with 19 percent among women with 12 years of education or less). Use of CBE and Pap testing was about 50 percent greater for women with 12 years of education or less and private insurance than for those with only Medicare coverage.

Women 65 years and over who were enrolled in HMOs were more likely to report recent mammography and Pap testing than women with fee-for-service insurance. Use of each of these two procedures was 13 percentage points greater for HMO enrollees than for women with fee-for-service coverage. However, recent use of a CBE did not differ for women in HMOs and those with fee-for-service coverage.

Women 40–49 years (table 4)

Overall, in 1992, 41 percent of women age 40–49 years reported a recent mammogram, 60 percent reported a Pap test, and 62 percent reported a CBE. Compared with women 50–64 years of age, women 40–49 years had a similar level of CBE; mammography was 8 percentage points lower; and Pap testing was 6 percentage points higher.

Health insurance coverage and educational attainment were both strongly associated with use of all three procedures for women 40–49 years of age. Only 18 percent of uninsured women reported recent mammography, 30 percent reported Pap testing, and 37 percent reported CBE. Among women with private insurance, 45 percent reported mammography, 64 percent reported Pap testing, and 66 percent reported CBE.

Among women with 12 years of education or less, those with private coverage were about twice as likely to report each of the three screening procedures as uninsured women. Among women with private health insurance coverage, those with more than 12 years of education reported levels of each of the three procedures that were about 10 percentage points higher than for those with less education.

For women 40–49 years of age, recent use of mammography, CBE, and Pap testing did not differ significantly

between HMO enrollees and those with fee-for-service coverage.

Discussion

Despite substantial increases in mammography use, in 1992 only half of the women aged 50–64 years and 39 percent of women aged 65 years and over reported a recent mammogram. Use of screening for breast and cervical cancer was greater for women with more education, except among women aged 50–64 years who were enrolled in HMOs, providing some evidence that HMO enrollment may improve access to preventive services for less educated middle-aged women. Among women 50–64 years of age with 12 years of education or less and among older women of all educational levels, HMO enrollees reported higher levels of mammography and Pap testing than did those with fee-for-service coverage.

Among uninsured women aged 50–64, only 19 percent reported recent mammography, about one-third the level of HMO enrollees. Although levels for all three breast and cervical cancer screening procedures were extremely low for uninsured women, the uninsured were about twice as likely to report a recent CBE as recent mammography (38 and 19 percent, respectively, for women aged 50–64 years). Among women 65 years of age and over a similarly low level of recent mammography was reported for those with only Medicare coverage (19 percent). Mammography levels may be even more affected by insurance coverage than CBE because mammography usually requires an additional visit, whereas CBE may be carried out as part of a routine physical examination.

This analysis documents variability in use of preventive services among women with different types of health insurance coverage. However, it is important to remember there may be wide ranges of coverage within the defined health insurance categories. For example, the HMO category contains a variety of model types (see Technical notes), and the fee-for-service category may be a mix of adequately insured and underinsured persons. Further, the proportion of women who are underinsured may be higher among women with 12 or fewer years of education than among more educated women. A 1992 study by the National Opinion Research Center (NORC) highlighted the increasing problem of underinsured persons who are at high financial risk due to severely limited insurance coverage, or high deductibles and copayments. In the NORC study, 19 percent of all persons reported difficulty in paying medical bills in the past year, and 75 percent of persons who reported difficulties had health insurance (20).

The cost of preventive care is generally covered in HMOs. However, some fee-for-service health insurance plans may exclude coverage for preventive health services. Recent legislation has sought to improve health care coverage for cancer screening as well as increase the use and quality of screening. The Omnibus Budget Resolution Act of 1990 (PL 101–508) established Medicare coverage for biennial mammography screening, effective January 1, 1991. By 1992, 42 states had adopted legislation requiring third-party payors to offer some form of coverage for mammography in their health insurance plans (21). However, the extent of the coverage that was legislated varies significantly among States (22). The Breast and Cervical Cancer Mortality Prevention Act (PL 101–135) of 1990 established model breast and cervical cancer control programs at the State level. The programs are administered by the Centers for Disease Control and Prevention and target low-income, elderly, and minority women (23). The Mammography Quality Standards Act of

Table 3. Percent of women 65 years and over who received cancer screening within the past year, by type of procedure, health insurance coverage, and educational attainment: United States, 1992

Type of procedure and health insurance coverage	Sample size	Educational attainment		
		Total	0–12 years	13 years or more
		Percent and standard error		
Mammogram				
Total	1,360	38.5 (1.6)	34.6 (1.8)	52.4 (3.3)
Medicare and private coverage[1]	988	43.9 (1.9)	39.7 (2.2)	56.0 (3.5)
Medicare and HMO[1]	129	55.4 (5.2)	52.1 (6.2)	63.2 (8.5)
Medicare and fee-for-service[1]	859	42.0 (2.0)	37.8 (2.2)	54.5 (3.9)
Medicare and Medicaid[1]	137	24.7 (4.2)	22.7 (4.1)	*
Medicare only	222	19.0 (3.2)	19.0 (3.4)	*
Clinical breast examination (CBE)				
Total	1,352	49.9 (1.5)	47.5 (1.7)	58.6 (3.3)
Medicare and private coverage[1]	981	54.7 (1.8)	52.3 (2.1)	61.9 (3.2)
Medicare and HMO[1]	129	55.3 (5.7)	51.7 (6.7)	63.4 (7.9)
Medicare and fee-for-service[1]	852	54.7 (1.9)	52.4 (2.2)	61.5 (3.5)
Medicare and Medicaid[1]	139	35.1 (4.5)	33.5 (4.5)	*
Medicare only	219	34.2 (3.9)	34.8 (4.2)	*
Pap test				
Total	1,356	35.5 (1.5)	33.4 (1.6)	42.9 (3.6)
Medicare and private coverage[1]	985	38.8 (1.8)	36.3 (2.0)	46.0 (3.8)
Medicare and HMO[1]	130	49.8 (4.9)	44.2 (5.7)	62.8 (8.7)
Medicare and fee-for-service[1]	855	37.0 (1.9)	35.1 (2.1)	42.6 (4.3)
Medicare and Medicaid[1]	137	28.5 (4.8)	27.1 (4.7)	*
Medicare only	221	22.4 (3.4)	23.5 (3.9)	*

[1]Includes a small number of persons who did not have Medicare coverage. Of all women 65 years and over, 3 percent did not have Medicare coverage.

NOTES: Based on the one-fourth of the NHIS sample that received the Cancer Control questions. HMO includes all persons who reported HMO coverage, regardless of other coverage reported. Persons with Medicaid who did not report HMO coverage are classified as Medicaid.

Table 4. Percent of women 40–49 years who received cancer screening within the past year, by type of procedure, health insurance coverage, and educational attainment: United States, 1992

Type of procedure and health insurance coverage	Sample size	Educational attainment		
		Total	0–12 years	13 years or more
		Percent and standard error		
Mammogram				
Total	1,110	41.2 (1.8)	34.5 (2.4)	48.2 (2.6)
Private coverage	851	44.9 (2.1)	38.2 (3.0)	50.4 (2.7)
HMO	236	50.1 (3.9)	42.9 (6.1)	55.6 (4.7)
Fee-for-service	615	43.0 (2.3)	36.6 (3.4)	48.5 (3.1)
Medicaid	88	34.2 (5.5)	27.4 (5.5)	*
Uninsured	147	17.9 (3.3)	19.8 (4.1)	*
Clinical breast examination (CBE)				
Total	1,101	61.6 (1.9)	55.8 (2.5)	67.6 (2.5)
Private coverage	845	66.1 (1.9)	60.9 (2.8)	70.3 (2.6)
HMO	234	67.2 (3.9)	64.3 (6.0)	69.4 (4.8)
Fee-for-service	611	65.7 (2.2)	59.7 (3.4)	70.7 (2.7)
Medicaid	86	52.8 (7.6)	55.5 (8.2)	*
Uninsured	146	36.6 (4.4)	34.0 (5.0)	*
Pap test				
Total	1,103	59.5 (1.8)	50.5 (2.5)	68.8 (2.5)
Private coverage	851	63.8 (1.9)	56.0 (3.0)	70.2 (2.6)
HMO	235	62.7 (3.9)	52.8 (5.7)	70.2 (4.5)
Fee-for-service	616	64.1 (2.1)	57.0 (3.5)	70.2 (2.7)
Medicaid	83	57.4 (6.9)	54.4 (8.0)	*
Uninsured	145	30.0 (4.3)	24.8 (4.7)	*

NOTES: Based on the one-fourth of the NHIS sample that received the Cancer Control questions. HMO includes all persons who reported HMO coverage, regardless of other coverage reported. Persons with Medicaid who did not report HMO coverage are classified as Medicaid. Uninsured persons are those who did not report private, Medicare, Medicaid, military/CHAMPUS, or public assistance coverage.

1992 requires establishment of Federal inspection of mammography facilities and standards for equipment, personnel, and practices.

The greater use of preventive care among women aged 50 years and over with HMO coverage compared with fee-for-service coverage is consistent with other reports (1,24–26). There are several possible mechanisms for the greater use of preventive care among HMO enrollees than among women with fee-for-service coverage. Luft postulated that the greater use of preventive care by HMO enrollees was the result of lower out-of-pocket payments in HMOs (25). Physicians may be more likely to recommend mammography for women with HMO coverage than fee-for-service coverage. Women enrolled in HMOs may be more likely to follow their physicians' recommendations for mammography because of lower out-of-pocket costs and greater ease in obtaining mammography. A greater emphasis on preventive medicine in HMOs may also partially explain the higher levels of mammography in HMOs.

In addition to insurance coverage, several other factors have been identified as correlates of cancer screening. Numerous studies have documented that lack of a physician's referral and lack of knowledge about the need for screening are key deterrents to obtaining screening (12,27,28). Screening utilization has been found to be greater for patients of obstetricians and gynecologists than of family practitioners or internists (29) and for patients of female physicians, especially if the physician is an internist or family practitioner (30).

In summary, data from the 1992 NHIS show that having some type of health insurance coverage was strongly associated with use of recent preventive services for women, and that, for women 50 years and over, HMO enrollees were more likely to receive recent preventive care than those with fee-for-service coverage. Continued efforts are clearly needed to attain the goal of regularly scheduled periodic screening for all women.

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Technical notes

Source of data

Data in this report are based on the 1992 National Health Interview Survey (NHIS), a continuing national household survey of the civilian noninstitutionalized population (14). Data are obtained on the personal, sociodemographic, and health characteristics of the family members and unrelated individuals living in these households. The 1992 NHIS included a special topics section on Cancer Epidemiology and Cancer Control, a collaborative effort of the National Center for Health Statistics (NCHS) and the National Cancer Institute (NCI).

The NHIS is a multistage probability sample design that permits a continuous sampling of the civilian noninstitutionalized population residing in the United States. Since 1985, the survey has been designed to yield a sample of about 49,000 households and 127,000 persons. Excluded from the sample are persons residing in nursing homes or other institutionalized settings, members of the Armed Forces, and U.S. nationals living abroad. The Cancer Control section of the questionnaire was administered to one-fourth of the NHIS sample households. Field operations, including the in-person household interviews, were conducted by the U.S. Bureau of the Census. Data were transmitted to NCHS for preparation, processing, and analysis.

Questions on cancer screening

In 1992 respondents aged 40 years or older were informed that ''a mammogram is an x ray taken only of the breasts by a machine that presses the breast against a plate.'' They were then asked, ''Have you ever heard of a mammogram?'' and ''When did you have your most recent mammogram?'' Clinical breast examinations (CBE) data were collected by informing the respondent ''A breast physical exam is when the breast is felt for lumps by a doctor or medical assistant.'' and ''When did you have your most recent breast physical exam?'' Pap smear information was obtained by asking, ''When did you have your most recent Pap smear test?'' (14).

Terms relating to insurance status

For the purposes of this report, a woman was considered to have Health Maintenance Organization (HMO) coverage if the respondent provided the name of the HMO plan to the interviewer, the plan name was included on an NCHS-derived list of HMOs, and if a positive report was provided to the interview question, ''Is this (plan name) plan a Health Maintenance Organization or HMO?'' If necessary, the respondent could be informed that ''Health Maintenance Organizations or HMOs, sometimes called Individual Practice Associations or IPAs, are plans whose members are required to use only those health care providers who work for the HMO or the IPA. Also, members do not have to submit claims for costs of medical care services.'' The NCHS list of HMOs was compiled from information provided by the Group Health Association of America, InterStudy, the Federal listing of ''qualified'' HMOs, Blue Cross/Blue Shield, Best, and other sources.

Definitions of the HMO model types that were included in the HMO analytic category are as follows:

Staff—An HMO that delivers health services through a physician group that is controlled by the HMO unit.

Group—An HMO that contracts with one independent group practice to provide health services.

Individual Practice Association (IPA)—An HMO that contracts directly with physicians in independent practices, and/or contracts with one or more associations of physicians in an independent practice, and/or contracts with one or more multispecialty group practices (but the plan is predominantly organized around solo or single practices).

Network—An HMO that contracts with two or more independent group practices, possibly including a staff group, to provide health services. Although a network may contain a few solo practices, it is predominantly organized around groups.

Mixed—Any HMO combining a group, staff, or network model and an IPA model. The HMO includes both group and solo practices.

Preferred Provider Organization (PPO)—an HMO that contracts with networks or panels of providers. Enrollees experience a financial penalty if they choose to get care from a nonaffiliated provider, but the option is available.

Fee-for-service coverage was defined as private coverage other than that in one of the six types of HMOs.

Background information on breast cancer

Breast cancer is the most common site of a new cancer among women and the second to lung cancer as a leading cause of cancer deaths among women (31). In 1993 approximately 182,000 new cases of invasive breast cancer were diagnosed and 46,000 deaths from breast cancer were expected. Breast cancer incidence increased during the early to mid-1980's, partially due to increases in early detection through use of mammography screening (32,33). The age-adjusted death rate for breast cancer in 1991 was the same as in 1980 (4). In 1983–90 the 5-year relative survival rate for breast cancer was 80 percent, up from 76 percent in 1980–82 (4).

Risk factors for breast cancer include advancing age, family history of breast cancer in a first-degree relative, high socioeconomic status, Caucasian race, early menarche, late menopause, nulliparity, and the absence of breast feeding (34). The majority of currently identified risk factors are not easily amenable to changes in a woman's personal health habits. Thus, the main medical focus for breast cancer management has been on early detection through screening and effective treatment of diagnosed cases.

The American Cancer Society (ACS) recommends an annual CBE for women over 40 years of age, a yearly mammogram for women aged 50 years and over, and a mammogram every 1 to 2 years for women aged 40–49 years (35). The United States Preventive Services Task Force (USPSTF) recommends mammography every 1 to

2 years from age 50 to 75 unless pathology is detected. Early screening is recommended for women at increased risk of breast cancer (36). In December 1993 the NCI recommended routine screening every 1 to 2 years, with mammography and CBE for women 50 years of age and over. They also indicated that ''randomized clinical trials have not shown a statistically significant reduction in mortality for women under the age of 50'' associated with the use of routine mammography screening (37).

Background information on cervical cancer

In 1993 an estimated 13,500 cases of invasive cervical cancer were diagnosed and 4,400 deaths were expected (31). Between 1973 and 1990 the age-adjusted incidence rate and mortality rate for invasive cervical cancer declined by about 3 percent per year. Five-year relative survival rates have remained stable at 67–69 percent since the mid-1970's (33).

Risk factors for cervical cancer include low socioeconomic status, early age at first intercourse, multiple sex partners, cigarette smoking, and certain sexually transmitted diseases (31,33).

Pap testing guidelines from the ACS and the NCI recommend annual Pap testing. After a woman has had three or more consecutive satisfactory normal annual examinations, the Pap test may be performed less frequently at the discretion of the provider (35).

Symbols	
- - -	Data not available
. . .	Category not applicable
–	Quantity zero
0.0	Quantity more than zero but less than 0.05
Z	Quantity more than zero but less than 500 where numbers are rounded to thousands
*	Figure does not meet standard of reliability or precision

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